Space Weather Forecast

Issued on Saturday 2 November 2024 at 01:08 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High solar activity with Moderate flares expected, and a chance of further Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was moderate with four Moderate flares, the largest of which from AR3878 in the northeast. There are thirteen active regions, all now numbered with the new AR3881 developing in the southeast, and the collection of spots south of AR3876 re-numbered as AR3871. AR3878 remains the most active flare source with a complex magnetic structure. AR3869 also remains a complex region within the cluster of spots in the southwest, with opposite polarity to what would be expected for a southern disc sunspot, although the magnetic demarcation between this spot and sounding regions is somewhat unclear. Most sunspots only showing slow evolution currently.

No Earth-directed CMEs (coronal mass ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds saw a decreasing trend from slightly elevated levels around 480km/s to current background speeds of around 390km/s, with the now declining influence of a transient CME. The Interplanetary Magnetic Field (IMF), Bt, was weak to moderate, peaking early in the period following transient arrival. The north-south component, Bz, varying weakly, but chiefly positive. Geomagnetic activity was Quiet to Unsettled (Kp0-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at S1 Minor Radiation Storm levels to start, falling below the S1 threshold at 01/0855 UTC and continuing to slowly ease.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate or High activity is expected to continue with occasional Moderate flares expected and a chance of further isolated Strong flares. Into days 3-4 (04-05 Nov) flare risk perhaps reducing somewhat as sunspot regions in the west begin to rotate off the visible disk.

Solar Wind / Geomagnetic Activity: A CME which left the sun during the 31st Nov has the potential to give a glancing blow to Earth late on day 2 (03 Nov) or into early day 3 (04 Nov). Quiet geomagnetic activity is expected initially. Activity expected to increase to become more generally Unsettled later into day 2 (03 Nov) and day 3 (04 Nov), with a chance of Active and a slight chance

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of G1 intervals given the risk of a glancing CME blow and faster solar wind influence. Activity currently expected to be generally Quiet to Unsettled once again by day 4 (05 Nov).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is now below the S1 Moderate Radiation Storm level, and continuing to slowly decline. However, any further notable flares bring a persistent chance for further enhancement during the period.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	20	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	80	70	70
Very Active	R3-R5 (X Class)	No	25	25	20	20

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	30	30	25	25
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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